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The influence of an intramolecular hydrogen bond on the 1,3-N,S-coordination of crown ether-containing N-phosphorylthiourea with Ni II

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Abstract

Reaction of the lithium salt of N-phosphorylated thiourea [4′-benzo-15-crwn-5]NHC(S)NHP(O)(OiPr)2 (HLI) with NiII leads to the chelate complex [NiLI 2]. The metal center is found in a square-planar N2S2 environment formed by the CS sulfur atoms and the P-N nitrogen atoms of two deprotonated LI ligands. Reaction of [NiLI 2] and its non-crown ether-containing analog Ni[PhNHC(S)NP(O)(OiPr)2] 2 ([NiLII 2]) with 2,2′-bipyridine (bipy) and 1,10-phenanthroline (phen) leads to the [Ni(bipy)LI,II 2] and [Ni(phen)LI,II 2] heteroligand complexes. The coordination mode is preserved for the phosphorus-containing ligands. The extraction properties of the crown ether-containing compounds towards alkali metal picrates were investigated. The molecular structures of HLI, [NiLI 2] and [Ni(bipy)LII 2] were elucidated by X-ray diffraction.

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